T-29-11

2SA1238

2029A PNP Epitaxial Planar Silicon Transistor

Differential Amp Applications

Applications

. Differential amp, current mirror.

Features

. Excellent in thermal equilibrium and suited for use in first-stage differential amp.
. Low noise.
. Matched pair capability.

Absolute Maximum Ratings at Ta=25°C

				unit
Collector to Base Voltage	V_{CBO}		-55	V
Collector to Emitter Voltage	V_{CEO}		-50	V
Emitter to Base Voltage	V_{EBO}		-5	V
Collector Current	I_C		-150	mA
Peak Collector Current	i_{cp}		-300	mA
Collector Dissipation	P_C	1 unit	200	mW
Total Dissipation	P_T		400	mW
Junction Temperature	T_j		150	°C
Storage Temperature	T_{stg}		-55 to +150	°C

Electrical Characteristics at Ta=25°C

			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	V_{CB}=-35V, I_E=0			-0.1	uA
Emitter Cutoff Current	I_{EBO}	V_{EB}=-4V, I_C=0			-0.1	uA
DC Current Gain	h_{FE}	V_{CE}=-6V, I_C=-1mA	100*		560*	
DC Current Gain Ratio	$h_{FE(small/large)}$	V_{CE}=-6V, I_C=-1mA	0.85	0.98		

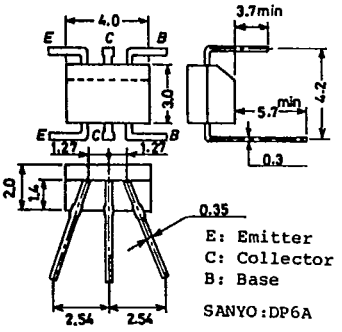
Continued on next page.

*: The 2SA1238 is classified by h_{FE}(small) as follows:

100 E 200	160 F 320	280 G 560

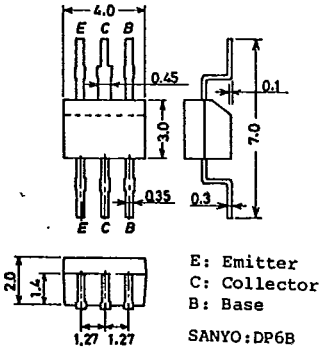
The 2SA1238 is provided with a surface mounted package.

Case Outline 2029A
(unit:mm)



E: Emitter
C: Collector
B: Base
SANYO:DP6A

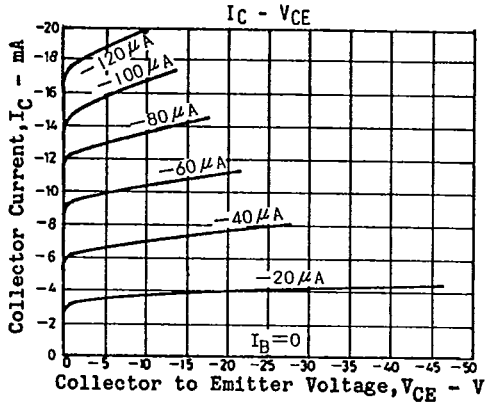
Case Outline 2030A
(unit:mm)

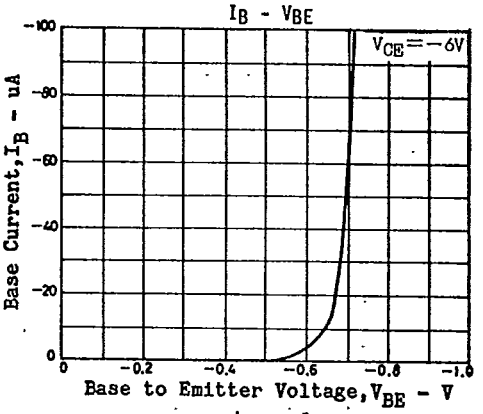


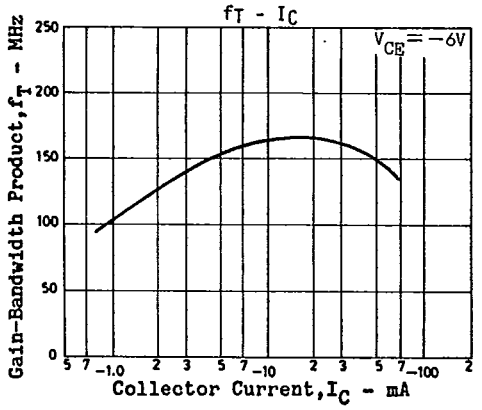
E: Emitter
C: Collector
B: Base
SANYO:DP6B

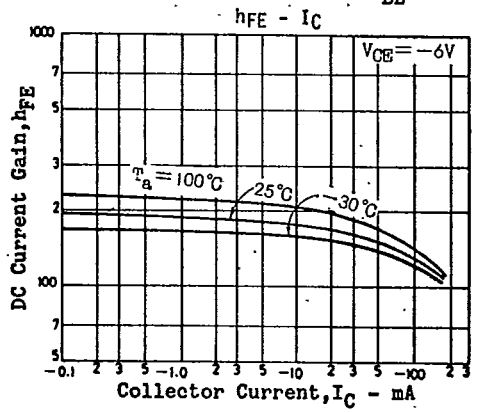
Continued from preceding page.

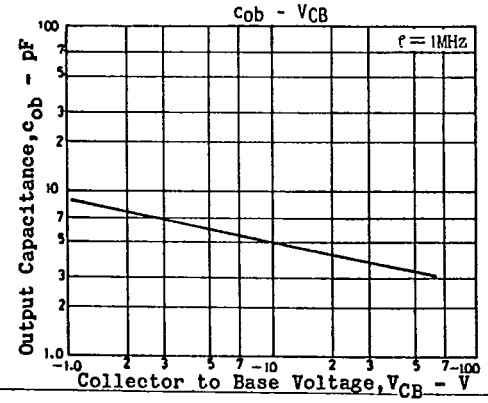
			min	typ	max	unit
Base to Emitter Voltage Drop	$V_{BE(large-small)}$	V_{CE}=-6V, I_C=-1mA		1.0	10	mV
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=-50mA, I_B=-5mA			-0.5	V
Gain-Bandwidth Product	f_T	V_{CE}=-6V, I_C=-1mA		100		MHz
Output Capacitance	C_{ob}	V_{CB}=-10V, f=1MHz		5.0		pF
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=-10uA, I_E=0	-55			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=-1mA, R_{BE}=∞	-50			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=-10uA, I_C=0	-5			V
Noise Level	$V_{NO(ave)}$	V_{CC}=30V, I_C=1mA, Rg=56kohm, VG=77dB/1kHz			35	mV
Noise Peak Level	$V_{NO(peak)}$	V_{CC}=30V, I_C=1mA, Rg=56kohm, VG=77dB/1kHz			200	mV

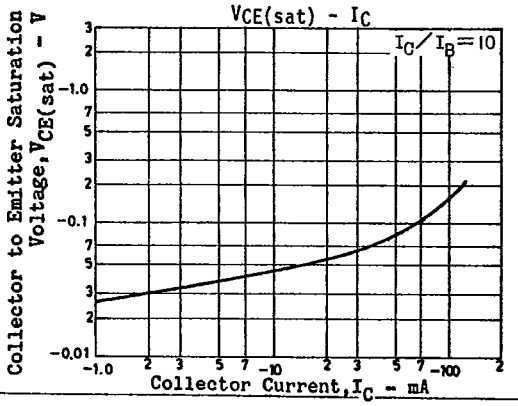


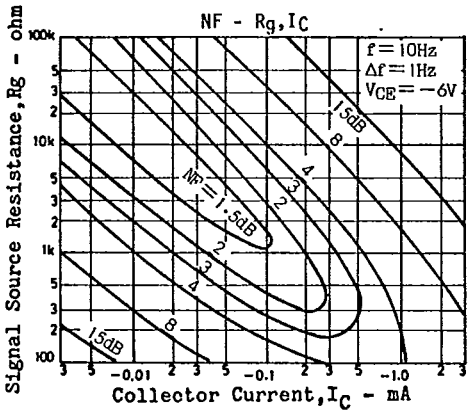


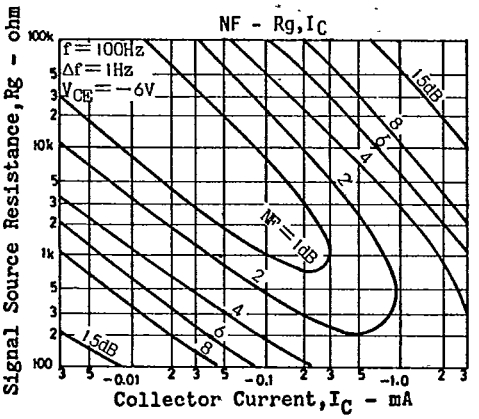


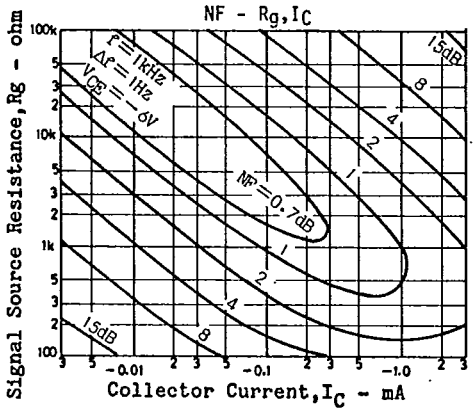


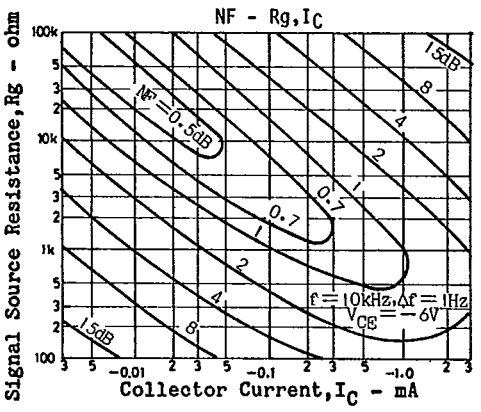


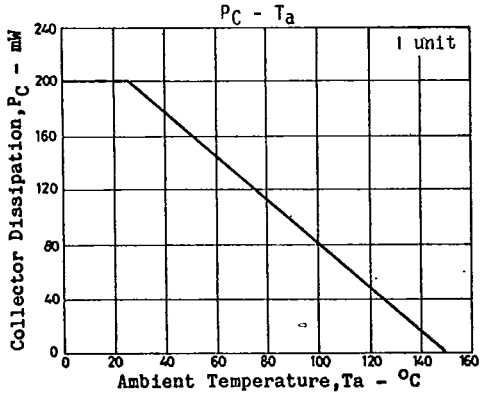



NF - Rg, IC
f = 10Hz
Δf = 1Hz
VCE = −6V
NF = 1.5dB
15dB
Signal Source Resistance, Rg - ohm
Collector Current, IC - mA


NF - Rg, IC
f = 100Hz
Δf = 1Hz
VCE = −6V
NF = 1dB
15dB
Signal Source Resistance, Rg - ohm
Collector Current, IC - mA


NF - Rg, IC
f = 1kHz
Δf = 1Hz
VCE = −6V
NF = 0.7dB
15dB
Signal Source Resistance, Rg - ohm
Collector Current, IC - mA


NF - Rg, IC
NF = 0.5dB
f = 10kHz, Δf = 1Hz
VCE = −6V
15dB
Signal Source Resistance, Rg - ohm
Collector Current, IC - mA

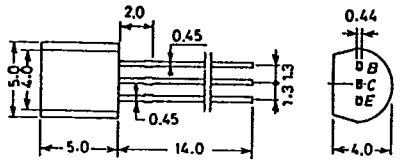

PC - Ta
1 unit
Collector Dissipation, PC - mW
Ambient Temperature, Ta - °C

T-91-20

CASE OUTLINES OF LEAD FORMED SMALL SIGNAL TRANSISTORS

- All of Sanyo lead formed small signal transistor case outlines are illustrated below.
- All dimensions are in mm, and dimensions which are not followed by min. or max. are represented by typical values.
- No marking is indicated.

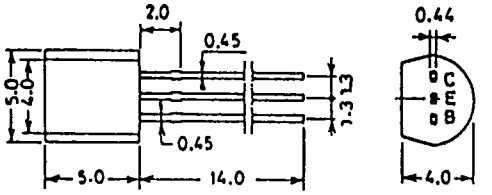
Case Outline—[2003A] unit: mm



JEDEC: TO-92
EIAJ : SC-43
SANYO: NP

B. Base
C. Collector
E. Emitter

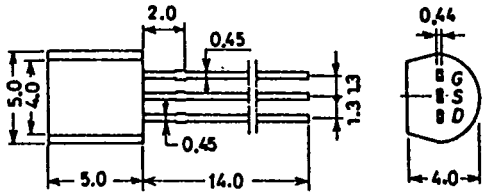
Case Outline—[2004A] unit: mm



JEDEC: TO-92
EIAJ : SC-43
SANYO: NP

C. Collector
E. Emitter
B. Base

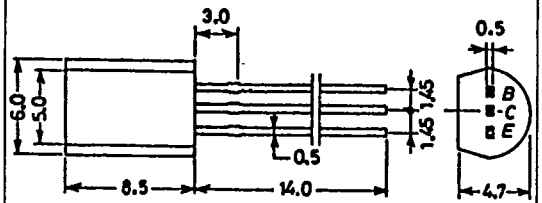
Case Outline—[2005A] unit: mm



JEDEC: TO-92
EIAJ : SC-43
SANYO: NP

G: Gate
S: Source
D: Drain

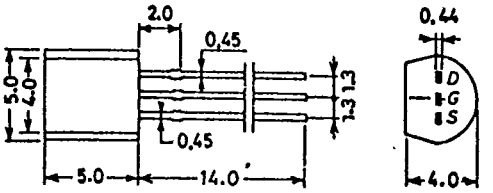
Case Outline—[2006A] unit: mm



EIAJ: SC-51
SANYO:MP

B: Base
C: Collector
E: Emitter

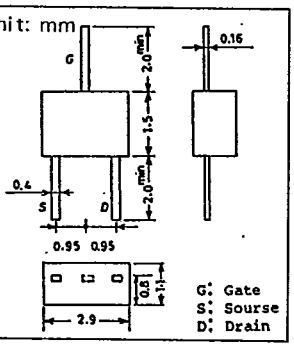
Case Outline—[2019A] unit: mm



JEDEC: TO-92
EIAJ : SC-43
SANYO: NP

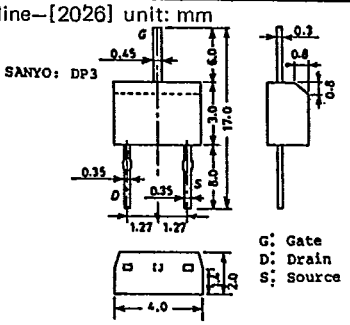
D: Drain
G: Gate
S: Source

Case Outline—[2025] unit: mm



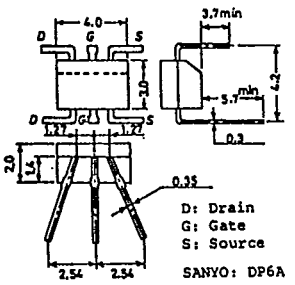
G: Gate
S: Sourse
D: Drain

Case Outline—[2026] unit: mm



G: Gate
D: Drain
S: Source

Case Outline—[2027A] unit: mm

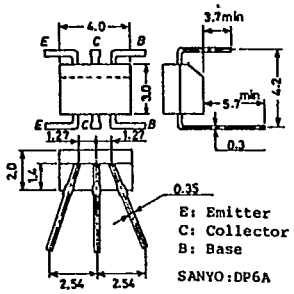


D: Drain
G: Gate
S: Source

SANYO: DP6A

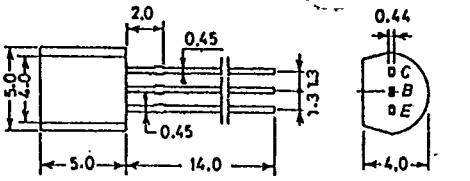
T-91-20

Case Outline—[2029A] unit: mm



E: Emitter
C: Collector
B: Base
SANYO:DP6A

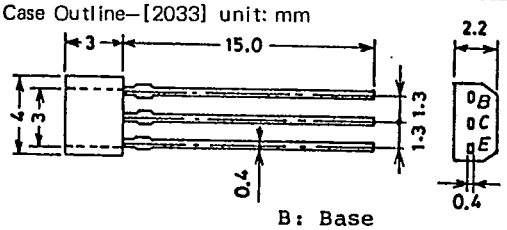
Case Outline—[2061] unit: mm



JEDEC: TO-92
EIAJ : SC-43

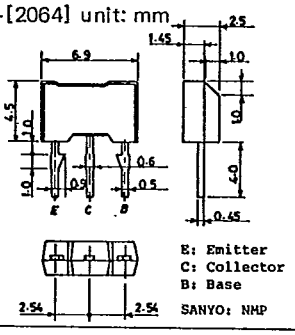
C: Collector
B: Base
E: Emitter
SANYO: NP

Case Outline—[2033] unit: mm



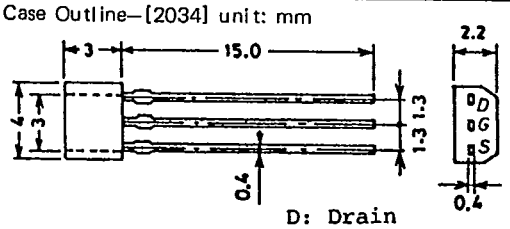
B: Base
C: Collector
E: Emitter
SANYO: SPA

Case Outline—[2064] unit: mm



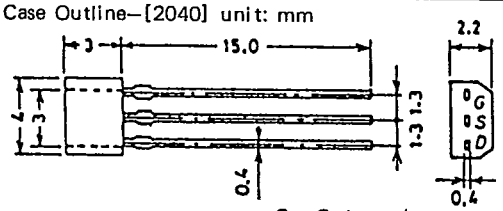
E: Emitter
C: Collector
B: Base
SANYO: NMP

Case Outline—[2034] unit: mm



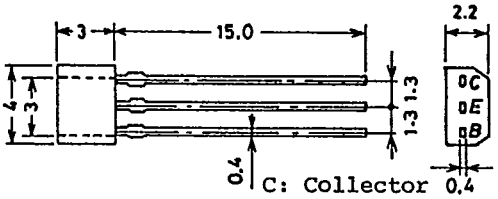
D: Drain
G: Gate
S: Source
SANYO: SPA

Case Outline—[2040] unit: mm



G: Gate
S: Source
D: Drain
SANYO: SPA

Case Outline—[2051] unit: mm



C: Collector
E: Emitter
B: Base
SANYO: SPA